

What Is Claimed Is:

1. A composite metallic filtering mesh, at least comprising: a bottom diffusion mesh and one or more twill weave meshes; one or more twill weave meshes fixed on an outer surface of the bottom diffusion mesh, wherein one or more twill weave meshes are applied in filtrating solid particulates in a fluid and the bottom diffusion mesh is applied in diffusing the filtrated fluid.
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2. The composite metallic filtering mesh according to claim 1, wherein the twill weave meshes are two or more layers; one or more inter-layer diffusion meshes are fixed between two layers of the twill weave meshes and one or more inter-layer diffusion meshes diffuse the filtrated fluid between the layers.
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3. The composite metallic filtering mesh according to claim 1 or 2, wherein an inter-layer diffusion mesh is fixed on an outer surface of the twill weave mesh in order to fully diffuse the fluid between the twill weave mesh and its external device.
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4. The composite metallic filtering mesh according to claim 1, wherein a metal fiber layer is fixed on the outer surface of the twill weave mesh; the metal fiber layer is formed by weaving metal wires so that the filtrated fluid is diffused more adequately.
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5. The composite metallic filtering mesh according to claim 2 or 4, wherein a metal fiber layer is fixed between the inter-layer diffusion meshes to ensure the smooth flowing of the filtered fluid.
6. The composite metallic filtering mesh according to claim 4, wherein the metal fiber layer is made of wires with 0.05-0.30 mm in diameter and the thickness of the metal fiber layer is 3-30 mm.
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7. The composite metallic filtering mesh according to claim 1, wherein the

bottom diffusion mesh is a woven mesh or a punching steel plate mesh with 5-50 meshes.

8. The composite metallic filtering mesh according to claim 1 or 2, wherein the aperture of the twill weave mesh is 40-400 micron.

5 9. The composite metallic filtering mesh according to claim 2, wherein the inter-layer diffusion mesh is a woven mesh with 10-60 meshes.

10 10. A sand control sleeve with the composite metallic filtering mesh according to any one of claims 1 to 9 comprising: a mesh sleeve formed of the composite metallic filtering mesh, a tubular inner protective shroud with through-bores distributed on its surface, and supporting rings; the mesh sleeve being fixed around the outer side of the tubular inner protective shroud; the supporting rings being respectively wrapping-set and fixed at connections of the outer sides of both ends of the tubular inner protective shroud and ends of the mesh sleeve .

11. The sand control sleeve according to claim 10, wherein ring hoops for fixing the mesh sleeve are fixed respectively on the outer sides of both ends of the mesh sleeve.

12. The sand control sleeve according to claim 10 or 11, wherein an outer protective shroud is fixed on the surface of the mesh sleeve; through-bores are opened and distributed on the surface of the outer protective shroud.

20 13. A sand control screen pipe with the sand control sleeve according to any one of claims 10 to 12, wherein the sand control screen pipe is composed of the sand control sleeve and a pipe body lengthen-fixed at each end of the sand control sleeve; or is composed of the sand control sleeve and a pipe body with through-bores on its surface, and the sand control sleeve ring-fixes on the pipe body and completely covers all through-bores on the pipe body; a connecting mechanism is provided on both ends of the sand control screen pipe for connecting with other assemblies.

14. The sand control screen pipe according to claim 13, wherein two or more supporting blocks are provided on the outer surface of the pipe body in order to make the sand control screen pipe be placed in the middle center while dropping down into the well.
- 5 15. A sand control screen pipe with the composite metallic filtering mesh according to any one of claims 1 to 9, at least comprising: a multi-holes base pipe, an inner protective shroud and a plurality of supporting rings of the inner protective shroud; wherein the composite metallic filtering mesh is fixed on the inner side of the multi-holes base pipe, and completely covers all through holes on the multi-holes base pipe; the inner protective shroud has petroleum-seeping holes, and is fixed on the inner side of the composite metallic filtering mesh and completely covers the composite metallic filtering mesh; the supporting ring of the inner protective shroud is fixed on both ends of the inner side of hole area of the multi-holes base pipe; the two ends of the inner protective shroud along the axial direction of the multi-holes base pipe are fixed respectively on the supporting ring.
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16. The sand control screen pipe according to claim 15, wherein an inner pipe is fixed on the inner side of the inner protective shroud.
17. The sand control screen pipe according to claim 15, wherein parts for connecting with other assemblies are set on both ends of the multi-holes base pipe.
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